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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,422	04/20/2004	Tae-kyoung Lee	46281	2559

1609 7590 11/30/2006

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EXAMINER

WRIGHT, KAINOA

ART UNIT PAPER NUMBER

2861

DATE MAILED: 11/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

29

Office Action Summary	Application No. 10/827,422	Applicant(s) LEE, TAE-KYOUNG	
	Examiner Kainoa BK Wright	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Examiner acknowledges the amendments to the specification and to claims 1, 2, 8, 9, 12 and 14-17.

Response to Arguments

2. Applicant's arguments filed 9/26/2006 with respect to claims 1, 8, 9 and 15 have been fully considered but they are not persuasive in view of the new ground(s) of rejection.

Regarding Claims 1 and 9: Applicant argues that the fixing member of Makino (6320647), as a first member 10 and a second member 12, does not teach or suggest the second member extending perpendicularly from the first member. Examiner interprets the second member 12 as extending perpendicularly from the first member 10 because the second member 12 is a three-dimensional object having a z dimension extending orthogonally outward from a plane created by an x-y surface of the first member 10. Hence, the second member 12 is taught to extend perpendicularly from the first member 10. Applicant further argues that Makino (647), as amended, does not teach the second member being bisected by a groove. Examiner agrees. However, examiner points out that the combination of Makino (647) in view of Makino (007) and further in view of Wantanabe, as pointed out in the Claim Rejections of this office action, does teach the second member being bisected by a groove.

Regarding Claim 8: Applicant argues that the grooved frame 27 of Wantanabe is not part of a single fixing member but separate from the fixing member 13. Examiner responds that it is the existence of a groove, not the relationship between the fixing member and the frame that is being taught by Wantanabe. Wantanabe clearly teaches a u-shaped groove for holding a lens within a structure that supports a beam unit. The functionality of applicant's groove is only to support the lens. This function is identical to the function of the groove in Wantanabe. Therefore, a groove for supporting a lens is known and can be readily applied to any supporting structure. Examiner applies this groove to the fixing bracket of Makino (007), as viewed from Makino (647) in view of Makino (007), thereby anticipating a second member having a groove which is operable to hold the lens of Makino (647). See Claim Rejections of this office action.

Regarding Claim 15: Similarly to claim 1, applicant argues that the assembly of the multi-beam light source unit of Makino (647) does not teach the construction step of placing a collimating lens assembly in a continuous semicircular groove of a second member extending perpendicular from a first member. Similarly to claim 1, examiner maintains the perpendicularity of the first and second members. Similarly to claim 1, examiner agrees that Makino (647) fails to teach a semicircular groove in the second member. However, examiner points out that the combination of Makino (647) in view of Makino (007) and further in view of Wantanabe, as pointed out in the Claim Rejections of this office action, does teach the second member being bisected by a groove. Furthermore, the collimating lens 35 of Makino (647), via pipe 6, is placed within the

Art Unit: 2861

semicircular groove of the second member taught by Makino (007) in view of Wantanabe.

3. Applicant's arguments with respect to claims 2-8, 10-14 and 16-17 are based on the dependencies of claims 2-8, 10-14 and 16-17 towards amended claims 1, 9 and 15 respectively and are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3,6-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makino (US 6320647), hereinafter referred to as Makino 1, in view of Makino (US 6947007), hereinafter referred to as Makino 2, and further in view of Wantanabe (US 6549228).

Makino 1 teaches a multi-beam light source unit comprising a laser diode 30, configured to emit a plurality of laser beams (col.4, ll.23-24); a rotating member, as a combination of a rotating base 3 and a support body 2; and a fixing member, as a combination of a first member (i.e. base 10) and a second member (i.e. optical housing 12), the first member operable to receive the rotating member and the second member extending perpendicularly from the first member (Fig.2). The second member is interpreted as extending perpendicularly from the first member because it is a three-

Art Unit: 2861

dimensional object with a z dimension extending orthogonally outward from a plane created by an x-y surface of the first member. The rotating member is rotatable at an angle to align a plurality of beams emitted from the laser diode and is fixable to the fixing member (Figs.2 & 4).

Makino 1 fails to teach the second member being bisected by a semicircular groove. Makino 1 also fails to teach the second member operable to secure the first member to a frame.

Makino 2 teaches a fixing bracket 49 operable for securing a fixing member 47 to a frame (Fig.8A). Although a frame is not explicitly shown, it is implied by the presence of the securing holes at the base of the second fixing member.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Makino 1 to include the fixing bracket of Makino 2 as a second member within Makino 1 in order to gain the ability to reposition the multi-beam light source within the frame or to any other object.

Makino 1 in view of Makino 2 still fails to teach the second member being bisected by a semicircular groove for receiving a lens holder 26.

Watanabe teaches a fixing member 27 being bisected by a semicircular groove (Fig.9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Makino 1 in view of Makino 2 to include the semicircular groove of Watanabe within the second member of Makino 2 in order to make it easier to change

the multi-beam light source unit without having to unfix the second member from the frame.

Regarding Claim 2: Makino 1 further teaches a press fit hole (i.e. center hole of support body 2 in Fig. 2) into which the laser diode is fitted; and a rotating boss, as a sleeve shaft 3e. Makino further discloses the fixing member comprising a first member, as the base 10; and a second member, as the optical housing 12, extending from the first member (Fig.2).

Regarding Claim 3: Makino 1 further teaches a pair of screws 11 provided to fix the rotating member to the first member of the fixing member (Fig.2); and a pair of circular arc-shaped long holes (i.e. arced holes of rotating base 3 in Fig.2) into which the screws are engaged.

Regarding Claim 6: Makino 1 further teaches a driving circuit board being connected to the rotating member, as a substrate 7 including a driving circuit for the semiconductor laser (Fig.2 & col.5, ll.9-15).

Regarding Claim 7: Makino 1 further teaches a collimating lens 35 (Fig.3) located within a lens holder, shown as a mirror pipe 6 (Fig.2), the lens holder being placed within the second member of the fixing member (Fig.2).

Regarding Claim 8: Makino 1 in view of Makino 2 and further in view of Wantanabe teaches a second member having a semicircular groove for receiving a lens holder, the second member having a plurality of holes for fixing the member to an object. See Regarding Claim 1.

Regarding Claim 9: Makino (US 6320647) teaches a multi-beam light source unit comprising a laser diode 30, configured to emit a plurality of laser beams (col.4, ll.23-24); a rotating member, as a combination of a rotating base 10 and a support body 2; and a fixing member, as a combination of a first member (i.e. base 10) and a second member (i.e. a piece of an optical housing 12), the first member operable to receive the rotating member and the second member extending perpendicularly from the first member (Fig.2). The second member is interpreted as extending perpendicularly from the first member because it is a three-dimensional object with a z dimension extending orthogonally outward from a plane created by an x-y surface of the first member. The rotating member is rotatable at an angle to align a plurality of beams emitted from the laser diode and is fixable to the fixing member (Figs.2 & 4). Makino 1 further teaches the multi-beam light source as usable within a laser scanning apparatus, thus teaching a laser scanning apparatus comprising the multi-beam light source unit; a scanning unit (Fig.1) for scanning the plurality of lasers onto a scanning plane 36 and a frame for supporting the multi-beam light source unit and scanning unit, as the entirety of optical housing 12. Makino 1 further teaches a polygon mirror 32; an image resulting lens 34, a cylindrical lens 31; and a synchronizing signal detection unit 37.

Makino 1 fails to teach the second member being bisected by a semicircular groove. Makino 1 also fails to teach the second member operable to secure the first member to the frame.

Makino 2 teaches a fixing bracket 49 operable for securing a fixing member 47 to a frame (Fig.8A). Although a frame is not explicitly shown, it is implied by the presence

Art Unit: 2861

of the securing holes at the base of the second fixing member which are apparently used to fix the fixing member to a floor surface of a frame.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Makino 1 to include the fixing bracket of Makino 2 as a second member within Makino 1 in order to gain the ability to reposition the multi-beam light source within the frame or to any other object.

Makino 1 in view of Makino 2 still fails to teach the second member being bisected by a semicircular groove for receiving a lens holder 26.

Watanabe teaches a fixing member 27 being bisected by a semicircular groove (Fig.9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Makino 1 in view of Makino 2 to include the semicircular groove of Watanabe within the second member of Makino 2 in order to make it easier to change the multi-beam light source unit without having to unfix the second member from the frame.

Regarding Claim 10: Makino 2 further teaches the light source being mounted and fixed to the bottom of the frame, via the second member (i.e. fixing bracket 49).

See Regarding Claim 9.

Regarding Claim 11: Makino 1 further teaches a polygon mirror, an image resulting lens, a cylindrical lens and a synchronization detection unit. See Regarding Claim 9.

Regarding Claim 12: Makino 1 further teaches a press fit hole (i.e. center hole of support body 2 in Fig.2) into which the laser diode is fitted; and a rotating boss, as a sleeve shaft 3e, the rotating member being rotatable about the rotating boss. Makino further discloses the fixing member comprising a first member, as the base 10; and a second member, as the optical housing 12, extending vertically from the first member (Fig.2).

Regarding Claim 13: Makino 1 further teaches a collimating lens 35 (Fig.3) located within a lens holder, disclosed by Makino 1 as a mirror pipe 6 (Fig.2), the lens holder being placed within the second member of the fixing member (Fig.2).

Regarding Claim 14: Makino 1 in view of Makino 2 and further in view of Wantanabe teaches a second member having a semicircular groove for receiving a lens holder, the second member having a plurality of holes for fixing the member to an object. See Regarding Claim 9.

Regarding Claim 15: Makino (US 6320647) teaches a multi-beam light source unit comprising a laser diode 30, configured to emit a plurality of laser beams (col.4, ll.23-24); a rotating member, as a combination of a rotating base 10 and a support body 2; and a fixing member, as a combination of a first member (i.e. base 10) and a second member (i.e. a piece of an optical housing 12), the first member operable to receive the rotating member and the second member extending perpendicularly from the first member (Fig.2). The second member is interpreted as extending perpendicularly from the first member because it is a three-dimensional object with a z dimension extending orthogonally outward from a plane created by an x-y surface of the

Art Unit: 2861

first member. Makino 1 further teaches a collimating lens 35 (Fig.3) located within a lens holder, disclosed by Makino 1 as a mirror pipe 6 (Fig.2), the lens holder being placed within the second member of the fixing member (Fig.2). The rotating member is rotatable at an angle to align a plurality of beams emitted from the laser diode and is fixable to the fixing member (Figs.2 & 4). Makino 1 further teaches the multi-beam light source as usable within a laser scanning apparatus, thus teaching a laser scanning apparatus comprising the multi-beam light source unit; a scanning unit (Fig.1) for scanning the plurality of lasers onto a scanning plane 36 and a frame for supporting the multi-beam light source unit and scanning unit, as the entirety of optical housing 12. Makino 1 further teaches a polygon mirror 32; an image resulting lens 34, a cylindrical lens 31; and a synchronizing signal detection unit 37.

Makino 1 fails to teach the second member being bisected by a semicircular groove. Makino 1 also fails to teach the second member operable to secure the first member to the frame.

Makino 2 teaches a fixing bracket 49 operable for securing a fixing member 47 to a frame (Fig.8A). Although a frame is not explicitly shown, it is implied by the presence of the securing holes at the base of the second fixing member which are apparently used to fix the fixing member to a floor surface of a frame.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Makino 1 to include the fixing bracket of Makino 2 as a second member within Makino 1 in order to gain the ability to reposition the multi-beam light source within the frame or to any other object.

Makino 1 in view of Makino 2 still fails to teach the second member being bisected by a semicircular groove for receiving a lens holder 26.

Watanabe teaches a fixing member 27 being bisected by a semicircular groove (Fig.9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Makino 1 in view of Makino 2 to include the semicircular groove of Watanabe within the second member of Makino 2 in order to make it easier to change the multi-beam light source unit without having to unfix the second member from the frame.

Makino 2 further teaches the assembly of a multi-beam light source unit concluding with a step of fixing of the unit to a fixing member upon the conclusion of which constitutes a completion of the fabrication of the multi-beam light source unit (col.10, ll.50-col.11, ll.15). During the fixing step of the assembly process, the laser diode is turned at an angle to align the beams (col.10, ll.50-64). Since this is referred to as the completion of the assembly of only the multi-beam light source (col.11, ll.10-15), and since the Fig.8a shows that the multi-beam light source clearly is intended to be fixed to something (presumably the frame of a scanning unit), it is assumed that the fixing of the entire multi-beam light source unit to the rest of the scanning unit is done at in a later or main assembly process.

It would have been obvious to one of ordinary skill in the art to modify Makino 1 in view of Makino 2 and further in view of Watanabe to include the manufacturing process of Makino 2 such that the multi-beam light source unit of Makino 1 in view of

Art Unit: 2861

Makino 2 and further in view of Wantanabe is assembled in a subassembly process and then fixed to the frame of the scanning unit in order to independently mass produce interchangeable scanning units and multi-beam light source units.

6. Claims 4-5 & 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makino (US 6320647) in view of Makino (US 6947007) and further in view of Wantanabe (US 6549228) as applied to claim 2 above, and further in view of Komatsu (US 5774248).

Makino 1 in view of Makino 2 and further in view of Wantanabe teach the limitations of claim 2 as stated above.

Makino 1 in view of Makino 2 and further in view of Wantanabe fail to teach the rotating member comprising a gear section engaged with a rotary gear for turning the rotating member.

Komatsu teaches a gear section 23 of a rotating member of a multi-beam light source engaged with a rotary gear capable of turning the rotating member.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Makino 1 in view of Makino 2 and further in view of Wantanabe to include the gear construction of Komatsu in order to provide for incremental adjustments, controlled by the rotation of the gear, in the beam alignment, as taught by Komatsu.

Regarding Claim 5: Official notice was previously given that it is old and well know to use a plurality of rotary gears in mechanical drive systems in order to provide

Art Unit: 2861

better control of a rotating member. For example: a plural gear setup limits the amount of play between the teeth of the gears and consequentially provides more control. This is a mechanical phenomenon that is well known in the basic levels of mechanical knowledge and is well used in all types of mechanical drive systems. Since official notice was given and no argument against it was made, official notice stands as confirmed by applicant.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Makino 1 in view of Makino 2 and further in view of Wantanabe and still further in view of Komatsu to include a secondary gear setup in order to provide further control of the drive system in light of what is old and well known in mechanical drive systems.

Regarding Claims 16 and 17: Makino 1 in view of Makino 2 and further in view of Wantanabe teach the multi-beam light source unit of claim 15 including a rotating member supporting the laser diode and a fixing member supporting the rotating member, the rotating member rotatable by an angle to align the position of the laser diode. See Claim 15.

Makino 1 in view of Makino 2 and further in view of Wantanabe fail to teach an alignment jig and further fails to teach the rotating member comprising a gear section and being turned by the alignment jig.

Komatsu teaches an alignment jig, as the combination of the gear 26 and motor 24 (Fig.3), fixed to a fixing member, as a base 12 (Fig.4), via a rotating member 11.

Art Unit: 2861

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Makino to include the alignment jig of Komatsu in order to provide for adjustments in the beam alignment at the fixing step of the assembly process being controlled by machine process as taught by Komatsu.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mogi et al. (6992690); Naoe et al. (5758950).

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 2861

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kainoa BK Wright whose telephone number is (571) 272-5102. The examiner can normally be reached on M-F 8:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meier Steve can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



KAI

11/15/06



HAI PHAM
PRIMARY EXAMINER